CLAIMS

What is claimed is:

1. A receiving wireless transmit receive unit (WTRU) for processing concurrent communication signals from a plurality of transmitting WTRUs that concurrently transmit successive data blocks in a plurality of K forward channels, the receiving WTRU comprising:

a receiver configured to receive successive data blocks of K concurrent transmissions transmitted from the transmitting WTRUs on the respective K forward channels;

a processor configured to compute individual channel characteristics for each forward channel k based on the characteristics of data signals received on all K forward channel; and

said processor configured to successively compute instantaneous Signal to Interference Ratio values for each forward channel j (iSIRj), for integers j = 1 to K, based on a cross correlation matrix of channel response characteristics of K concurrently received data blocks and to selectively compute an average value that is used for the computing the individual channel characteristics for the forward channel k.

2. The invention of claim 1 where the transmitting WTRUs are configured to make forward channel power adjustments as a function of characteristics of the data signals as received over the respective forward channel in which closed loop transmission power control for the forward channel k is implemented wherein the receiving WTRU is configured to compute transmit power control signals by producing power step commands as a function of computed Target Signal to Interference Ratios for the forward channel k (Target SIRks) in comparison to a signal characteristic SIRk value wherein said processor is configured to compute the signal characteristic SIRk values as a selectively defined average value of iSIRj values.

3. The invention of claim 2 where each Target SIR is determined as a function of a Block Error Rate estimate for the forward channel k (BLERk estimate) wherein said processor is configured to compute the BLERk estimate as a selectively defined average value of iSIRj values.

4. The invention of claim 3 further comprising a transmitter configured to transmit on a reverse channel the transmit power control signals for forward channel power adjustments of forward channel k.

5. The invention of claim 1 wherein said processor is configured to compute a signal characteristic SIRk value as a selectively defined average value of iSIRj values as the individual channel characteristic for the forward channel for the processing of the data blocks received on the forward channel.

6. The invention of claim 1 wherein said processor is configured to compute a Block Error Rate estimate for the forward channel k (BLERk estimate)as a selectively defined average value of iSIRj values as the individual channel characteristic for the forward channel for the processing of the data blocks received on the forward channel

7. The invention of claim 1 wherein said processor is configured to compute the average value that is used for the computing the individual channel characteristics for each forward channel k by computing an expected instantaneous raw Bit Error Rate (BER) for the channel k (EIRBk) as a function of iSIRk defined by

$$EIRBk = \tilde{Q}(iSIRk)$$

where $\tilde{Q}(x) = Q\left(\sqrt{x}\right)$ and $Q(x) = \int_{x}^{\infty} \frac{1}{\sqrt{2\pi}} e^{-x^2/2} dx$, and then computing an average of selected EIRBk values to define a raw Bit Error Rate for the channel k (raw BERk).

8. A receiving wireless transmit receive unit (WTRU) for implementing transmission power control for a plurality of transmitting WTRUs that concurrently transmit successive data blocks in a plurality of K forward channels where the transmitting WTRUs are configured to make forward channel power adjustments as a function of characteristics of the data signals as received over the respective forward channel, the receiving WTRU comprising:

a receiver configured to receive successive data blocks of K concurrent transmissions transmitted from the transmitting WTRUs on the respective K forward channels;

a processor configured to compute transmit power control signals for a forward channel k based on the characteristics of data signals received on all K forward channel; and

said processor configured to successively compute instantaneous Signal to Interference Ratio values for each forward channel j (iSIRj), for integers j = 1 to K, based on a cross correlation matrix of channel response characteristics of K concurrently received data blocks and to selectively compute an average value that is used for the computing transmit power control signals for the forward channel k.

9. The invention of claim 8 in which closed loop transmission power control for the forward channel k is implemented wherein the receiving WTRU is configured to compute the transmit power control signals by producing power step commands as a function of computed Target Signal to Interference Ratios for the forward channel k (Target SIRks) in comparison to a signal characteristic SIRk value wherein said processor is configured to compute the signal characteristic SIRk values as a selectively defined average value of iSIRj values.

10. The invention of claim 9 where each Target SIR is determined as a function of a Block Error Rate estimate for the forward channel k (BLERk estimate)

wherein said processor is configured to compute the BLERk estimate as a selectively defined average value of iSIRj values.

11. The invention of claim 10 further comprising a transmitter configured to transmit on a reverse channel the transmit power control signals for forward channel power adjustments of forward channel k.

12. The invention of claim 8 in which closed loop transmission power control for the forward channel k is implemented wherein the receiving WTRU is configured to compute the transmit power control signals by producing power step commands as a function of computed Target Signal to Interference Ratios for the forward channel k (Target SIRks) where each Target SIR is determined as a function of a Block Error Rate estimate for the forward channel k (BLERk estimate) wherein said processor is configured to compute the BLERk estimate as a selectively defined average value of iSIRj values.

13. The invention of claim 8 further comprising a transmitter configured to transmit on a reverse channel the transmit power control signals for forward channel power adjustments of forward channel k.

14. The invention of claim 8 wherein said processor is configured to compute the average value that is used for the computing the individual channel characteristics for each forward channel k by computing an expected instantaneous raw Bit Error Rate (BER) for the channel k (EIRBk) as a function of iSIRk defined by

$$EIRBk = \tilde{Q}(iSIRk)$$

where $\tilde{Q}(x) = Q\left(\sqrt{x}\right)$ and $Q(x) = \int_{x}^{\infty} \frac{1}{\sqrt{2\pi}} e^{-x^2/2} dx$, and then computing an average of selected EIRBk values to define a raw Bit Error Rate for the channel k (raw BERk).

15. A method for a receiving wireless transmit receive unit (WTRU) for processing concurrent communication signals from a plurality of transmitting WTRUs that concurrently transmit successive data blocks in a plurality of K forward channels, the receiving WTRU comprising:

receiving successive data blocks of K concurrent transmissions transmitted from the transmitting WTRUs on the respective K forward channels;

computing individual channel characteristics for each forward channel k based on the characteristics of data signals received on all K forward channel by successively computing instantaneous Signal to Interference Ratio values for each forward channel j (iSIRj), for integers j = 1 to K, based on a cross correlation matrix of channel response characteristics of K concurrently received data blocks and then selectively computing an average value that is used for the computing the individual channel characteristics for the forward channel k.

16. The method of claim 15 where the transmitting WTRUs are configured to make forward channel power adjustments as a function of characteristics of the data signals as received over the respective forward channel in which closed loop transmission power control for the forward channel k is implemented, further comprising computing transmit power control signals by producing power step commands as a function of computed Target Signal to Interference Ratios for the forward channel k (Target SIRks) in comparison to a signal characteristic SIRk value wherein the signal characteristic SIRk values is computed as a selectively defined average value of iSIRj values.

17. The method of claim 16 where each Target SIR is determined as a function of a Block Error Rate estimate for the forward channel k (BLERk estimate) wherein the BLERk estimate is computed as a selectively defined average value of iSIRj values.

18. The method of claim 17 further comprising transmitting on a reverse channel the transmit power control signals for forward channel power adjustments of forward channel k.

19. The method of claim 15 wherein a signal characteristic SIRk value is computed as a selectively defined average value of iSIRj values as the individual channel characteristic for each forward channel and is used for the processing of the data blocks received on the respective forward channel.

20. The method of claim 19 wherein a Block Error Rate estimate is computed for each forward channel k (BLERk estimate)as a selectively defined average value of iSIRj values as the individual channel characteristic for each forward channel and is used for the processing of the data blocks received on the respective forward channel

21. The method of claim 15 wherein the average value that is used for the computing the individual channel characteristics for each forward channel k is computed by computing an expected instantaneous raw Bit Error Rate (BER) for the channel k (EIRBk) as a function of iSIRk defined by

$$EIRBk = \tilde{Q}(iSIRk)$$

where $\tilde{Q}(x) = Q\left(\sqrt{x}\right)$ and $Q(x) = \int_{x}^{\infty} \frac{1}{\sqrt{2\pi}} e^{-x^2/2} dx$, and then computing an average of selected EIRBk values to define a raw Bit Error Rate for the channel k (raw BERk).